ABSTRACT

A remote plasma cleaning system includes a high conductance delivery line that delivers activated species from a remote plasma generator to a processing chamber. The delivery line preferably has a conductance of greater than 40 liters per second, enabling the power levels of the remote plasma generator to be maintained at less than about 3 kW. In one embodiment, activated species may be introduced into the processing chamber via one or more inlet ports disposed in a side portion of the processing chamber. In another embodiment, a coaxial inject/exhaust assembly enables activated species to be introduced into the processing chamber via an inner tube and gases to be exhausted from the processing chamber via an outer tube. Other embodiments incorporate an compound valve in the delivery system for selectively isolating the RPC chamber from the processing chamber and an optical baffle for protecting sensitive components of the isolation valve from exposure to ion bombardment and plasma radiation. The processing chamber may also include flow channels that enable activated species to clean cavities and components located underneath the susceptor, such as lift pin assemblies. Endpoint detection of the remote plasma clean may be performed by igniting a second low-power plasma in the processing chamber from activated species generated by the remote plasma generator, and monitoring emission lines (or ratios thereof) from the second plasma using an optical detector.